

WHAT IS CLAIMED IS:

1. A superconducting filter apparatus comprising:
 - a superconducting filter that exhibits a prescribed pass-band characteristic when cooled to cryogenic temperatures;
 - 5 a refrigerator for cooling said superconducting filter to cryogenic temperatures;
 - a pilot signal generator for generating a pilot signal that is outside said pass band and inputting 10 said pilot signal to the superconducting filter together with an antenna receive signal; and
 - 15 a discriminating unit for discriminating abnormality in the refrigerator based upon the level of the pilot signal contained in a signal that is output from the superconducting filter.
2. A superconducting filter apparatus according to claim 1, wherein said pilot signal generator is provided in the vicinity of a receive antenna.
3. A superconducting filter apparatus according to 20 claim 1, wherein said pilot signal generator has a pilot signal radiating antenna, said radiating antenna being provided in the vicinity of said receive antenna.
4. A superconducting filter apparatus according to claim 2, wherein an isolator is inserted into an 25 antenna feeder line.
5. A superconducting filter apparatus according to claim 1, wherein said discriminating unit detects the level of the pilot signal contained in the signal that is output from the superconducting filter and judges 30 extent of an abnormality based upon the waveform of the detected level.
6. A superconducting filter apparatus according to claim 1, wherein said pilot signal generator generates two waves of pilot signals having different frequencies 35 and inputs the pilot signals to said superconducting filter, and said discriminating unit detects the level of each pilot signal and judges extent of an abnormality based upon the waveforms of each of the detected levels.
- 40 7. A wireless receiving amplifier for amplifying a signal of a prescribed band in a signal received by an antenna and outputting the amplified signal, comprising:
 - a superconducting filter that exhibits a 45 prescribed pass-band characteristic when cooled to cryogenic temperatures;

- a low-noise amplifier for amplifying a signal that is output from the superconducting filter;
- 5 a refrigerator for cooling said superconducting filter and low-noise amplifier to cryogenic temperatures;
- 10 a pilot signal generator for generating a pilot signal that is outside said pass band and inputting said pilot signal to the superconducting filter together with an antenna receive signal; and
- 15 a discriminating unit for discriminating abnormality in the refrigerator based upon the level of the pilot signal contained in a signal that is output from the low-noise amplifier.
8. A wireless receiving amplifier according to claim 9,
- 15 wherein said pilot signal generator has a pilot signal radiating antenna, said radiating antenna being provided in the vicinity of said receive antenna.
9. A wireless receiving amplifier according to claim 8,
- 20 wherein an isolator is inserted into an antenna feeder line.
10. A wireless receiving amplifier according to claim 7, wherein said discriminating unit detects the level of the pilot signal contained in the signal that is output from the low-noise amplifier and judges extent 25 of an abnormality based upon the waveform of the detected level.
11. A wireless receiving amplifier according to claim 7, wherein said pilot signal generator generates two waves of pilot signals having different frequencies and 30 inputs the pilot signals to said superconducting filter, and said discriminating unit detects the level of each pilot signal contained in the signal that is output from the low-noise amplifier and judges extent of an abnormality based upon the waveforms of each of the detected levels.
12. A wireless receiving amplifier for amplifying a signal of a prescribed band in a signal received by an antenna and outputting the amplified signal, comprising:
- 40 a superconducting filter that exhibits a prescribed pass-band characteristic when cooled to cryogenic temperatures;
- a low-noise amplifier for amplifying a signal that is output from the superconducting filter;
- 45 a refrigerator for cooling said superconducting filter and low-noise amplifier to cryogenic

temperatures;

5 pilot signal applying means for applying a pilot signal that is outside said pass band to a portion intermediate the superconducting filter and low-noise amplifier; and

10 a discriminating unit for detecting a decline in the level of the pilot signal contained in a signal that is output from the low-noise amplifier, deciding that the refrigerator is abnormal when the level of the pilot signal falls to a predetermined level, and deciding that the low-noise amplifier is abnormal when the level of the pilot signal falls to a level other than the predetermined level.

15 13. A wireless receiving amplifier for amplifying a signal of a prescribed band in a signal received by an antenna and outputting the amplified signal, comprising:

20 a superconducting filter that exhibits a prescribed pass-band characteristic when cooled to cryogenic temperatures;

25 a low-noise amplifier for amplifying a signal that is output from the superconducting filter;

30 a refrigerator for cooling said superconducting filter and low-noise amplifier to cryogenic temperatures;

35 a pilot signal input unit for generating a first pilot signal that is outside said pass band and inputting this pilot signal to the superconducting filter together with an antenna receive signal;

40 a pilot signal applying unit for applying a second pilot signal that is outside said pass band to a portion intermediate the superconducting filter and low-noise amplifier; and

45 a discriminating unit for discriminating abnormality in the refrigerator based upon detected level of the first pilot signal contained in a signal that is output from the low-noise amplifier, and discriminating abnormality in the low-noise amplifier based upon a decline in the level of the second pilot signal.